

PREVAIL

WR2004RJ

Four-way Return Optical Receiver Manual



1. Product Summary

WR2004RJ Optical receiver can automatically set or manually adjust the input signal on/off function (RFOG), greatly curb the overall network noise. Add optical AGC function, keep the output constant when the signal changed in a wide range; and add microcomputer condition monitoring circuit and front panel display screen, support standard class II network management transponder.

2. Performance Characteristics

- Optimized circuit design, SMT process production, optimized signal path, make the photoelectric signal transmission more smooth.
- SCM control working status, LCD displays the parameters, convenience and intuitive operation, and stable performance.
- Excellent AGC characteristic, keep stable output level in the received optical power range -10~0dBm.
- Can switch to burst mode, greatly reduced the link aggregation noise; with single way RF shut off function, the localization diagnosis of ingress noise is easy.
- Support dual power supply hot backup mode and four-way mixed output mode.
- Reserved data communication interface, can connect with Ethernet transponder, access to network management system.

3. Technique Parameter

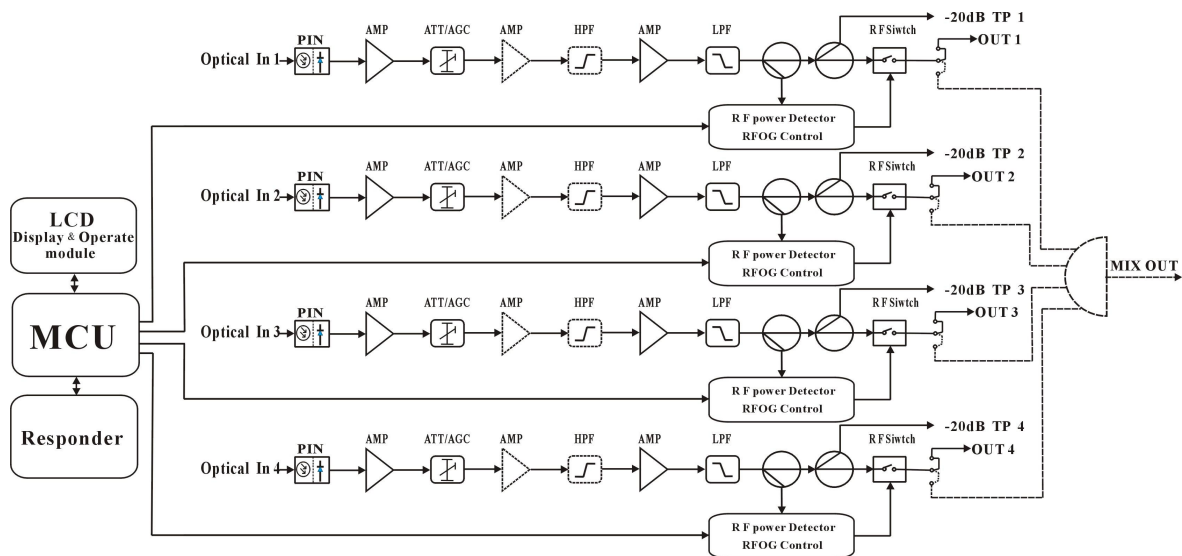
Item	Unit	Technical Parameters
Receiving Optical Power Range	dBm	-27~0
Optical AGC Range	dBm	-10~0
Nominal Optical Wavelength	nm	1100~1600
Optical Fiber Connector Type		FC/APC, SC/APC
Optical Return Loss	dB	>45
Frequency Range	MHz	5~200
Rated Output Level	dBμV	≥105 (-10~0dBm)
Flatness in Band	dB	±1
Return Loss	dB	≥ 16
Output Impedance	Ω	75
Adjustment Range of Output Level	dB	10 (Normal mode, turn on the optical AGC function)
		30 (Normal mode, turn off the optical AGC function, adopt MGC control)
		30 (RFOG burst mode)
The Accuracy of RF Test Port	dB	-20±1
Isolation between channels	dB	>65
RF connector type		Female F connector or male F connector

NPR Dynamic Range	dB	≥ 15 (NPR ≥ 30 dB) Use DFB laser	≥ 10 (NPR ≥ 30 dB) Use FP laser
Supply Voltage	V	AC90V-250V/50Hz or DC -48V	
Consumption	W	20	
Operating Temperature	°C	-20~ +45	
Storage Temperature	°C	-20 ~ +65	
Relative Humidity	%	Max 95% no condensation	
Dimension	mm	483 (L) × 365 (W) × 44 (H)	

Note: The non-linear distortion index, link flatness and noise power ratio dynamic range are the indexes of link that is composed of return optical transmitter and return optical receiver.

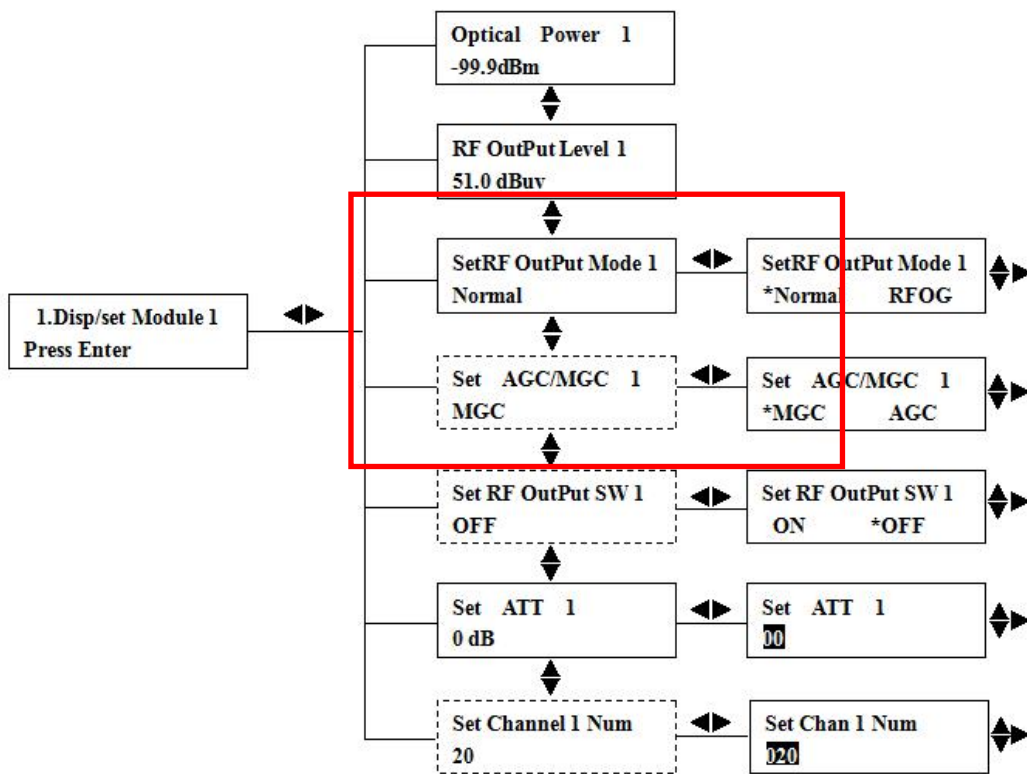
Burst Mode *		
Signal Output Turn On Threshold	dB μ V	≥ 70
Signal Output Turn Off Threshold	dB μ V	≤ 62
Signal Output Turn On Time (t1)	us	$0.5 \leq t1 \leq 1$
Signal Output Turn Off Time (t2)	us	$0.5 \leq t2 \leq 1.5$

4. Block Diagram



Note: The part in the virtual frame is the reserved circuit.

5. Normal/RFOG Working Mode Introductions

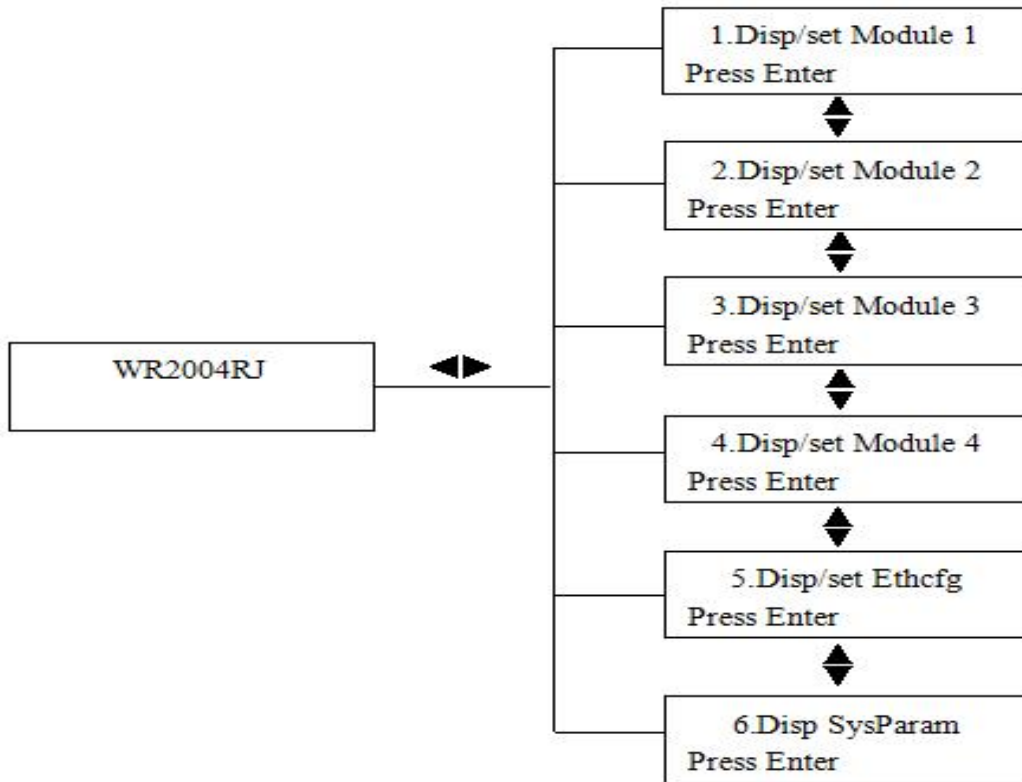


Working Mode	Description
Normal: AGC/MGC	1. Normal is the general working mode. AGC or MGC optional. 2. Select AGC: turn on the optical AGC function, the output level will not vary with the change of received optical power, its adjustable range is 10dB. 3. Select MGC: turn off the optical AGC function, the output level will vary with the change of received optical power, its adjustable range is 30dB.
RF OutPut SWx: ON/OFF	Under the Normal mode, can forcedly shut off the RF signal by RF OutPut SWx: ON/OFF menu. There is no this menu under the RFOG mode.
RFOG	1. RFOG is the burst working mode. Automatic turn off the optical AGC function. 2. Under the RFOG mode, there is RF signal output only when input the return optical signal; otherwise, there is no RF signal output.

6. Function Display and Operating Instruction

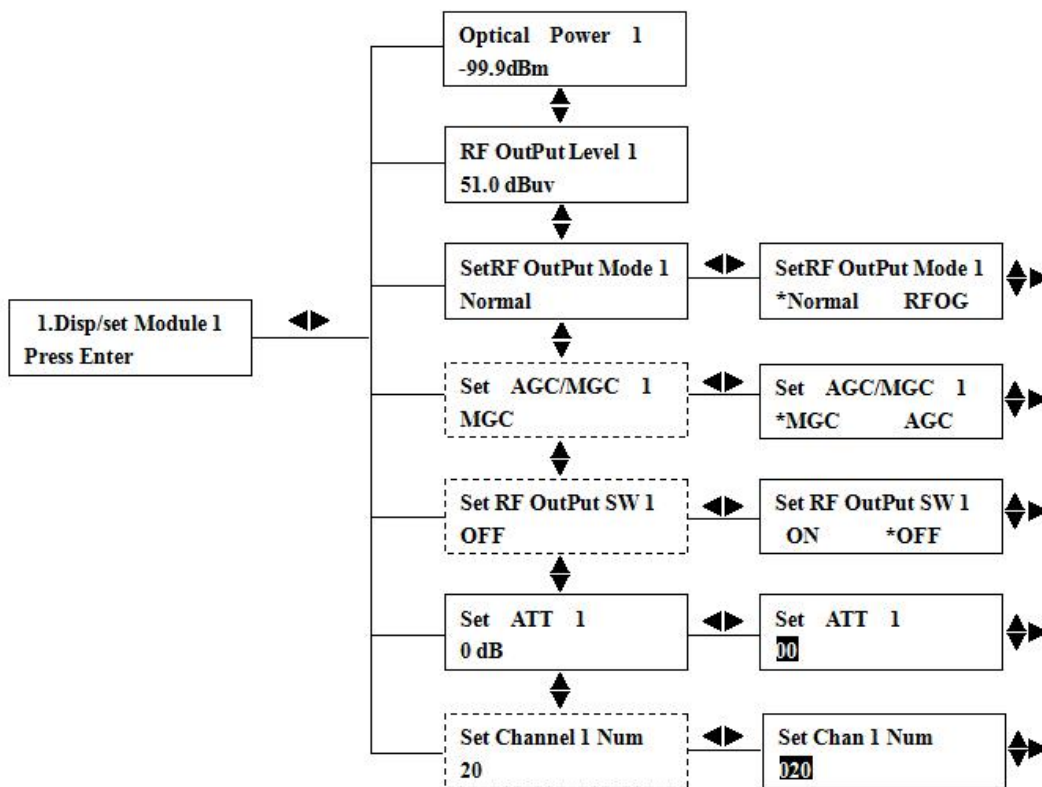
- ◀ : ESC button
- ▶ : Enter button
- ▲ : up button, increase the parameter value
- ▼ : down button, decrease the parameter value

6.1 Main menu



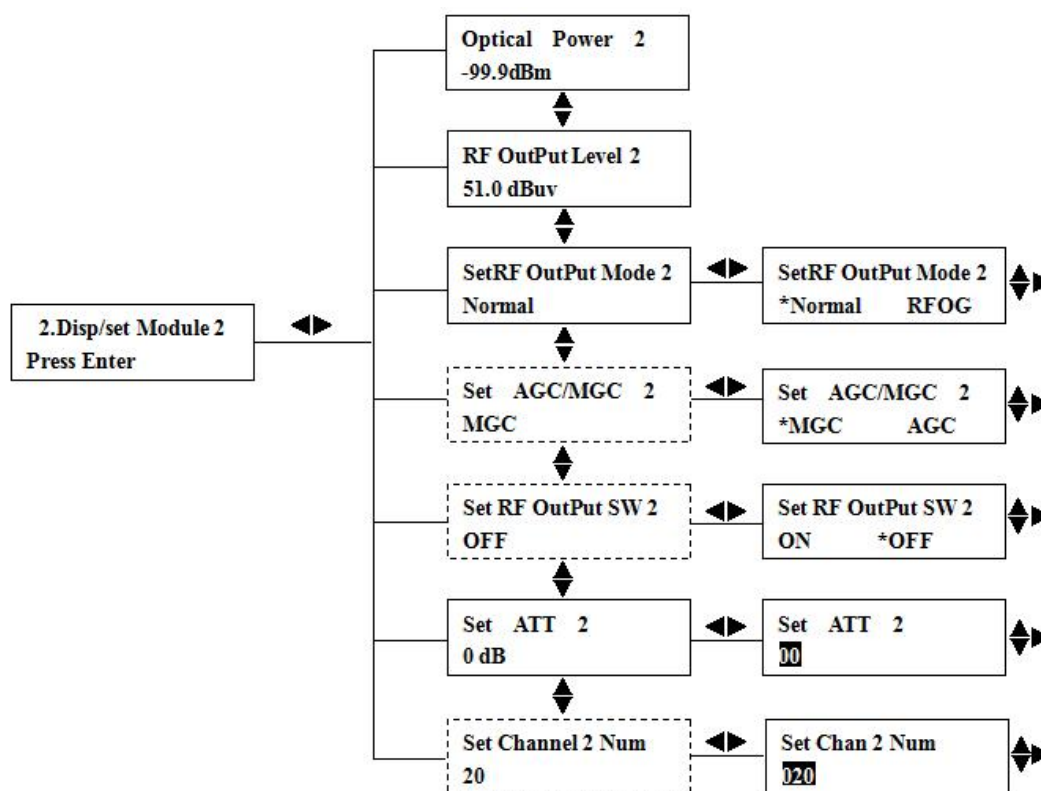
Displayed parameters	Comment
WR-2004-JI	Boot display: machine model WR-2004-JI
1.Disp/set Module 1: Press Enter	Menu 1: display/set the first way return module
2.Disp/set Module 2: Press Enter	Menu 2: display/set the second way return module
3.Disp/set Module 3: Press Enter	Menu 3: display/set the third way return module
4.Disp/set Module 4: Press Enter	Menu 4: display/set the fourth way return module
5.Disp/set EthCfg: Press Enter	Menu 5: display/set the Ethernet parameters
6.Disp SysParam: Press Enter	Menu 6: display the internal temperature

6.2 The setting menu of the first way return module



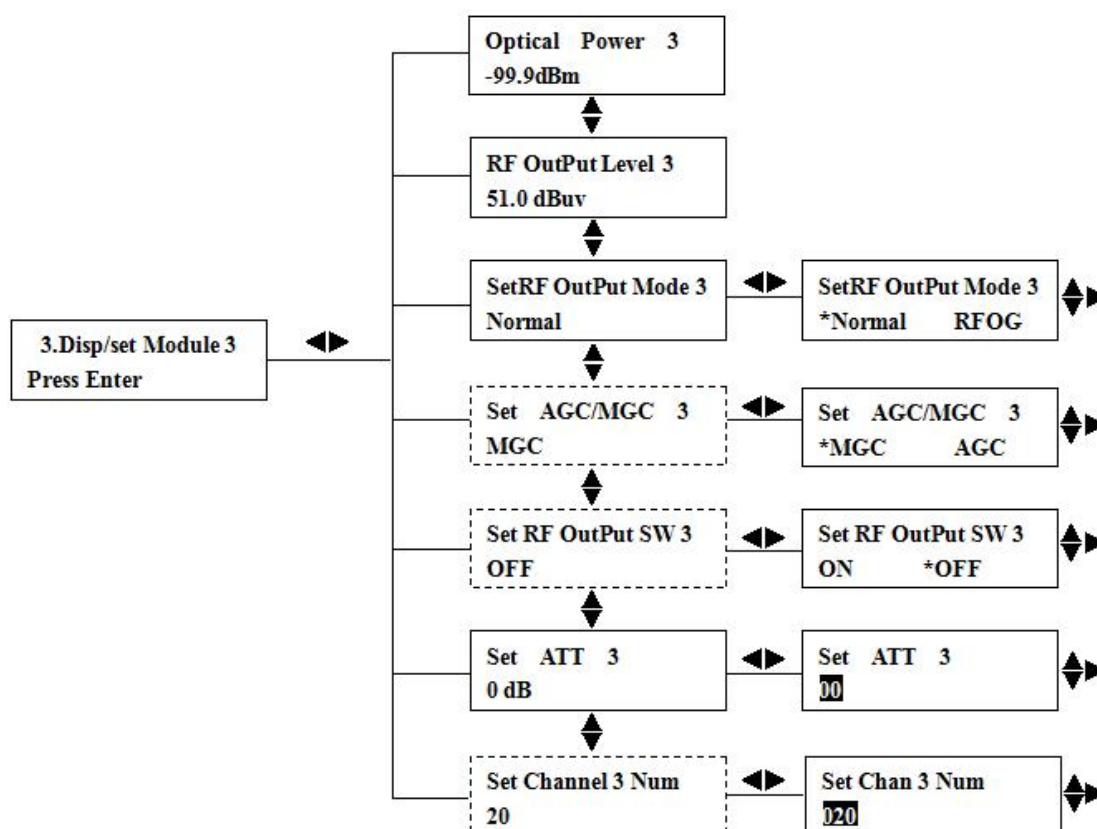
Displayed parameters	Comment	Remark
Optical Power 1 -99.9dBm	The input optical power of the first way return module	
RF OutPut Level 1 51.0 dBuv	The output level of the first way return module	
SetRF OutPut Mode 1 Normal	Set the RF output mode of the first way return module	Two modes optional: Normal: common mode; RFOG: burst mode.
Set AGC/MGC 1 MGC	Set the ATT mode of the first way return module	Two modes optional: AGC: turn on the optical AGC mode; MGC: turn off the optical AGC mode, manual adjustment. This menu is hidden under the RFOG mode.
Set RF OutPut SW 1 OFF	Set the RF output switch of the first way return module	ON: turn on; OFF: turn off This menu is hidden under the RFOG mode.
Set ATT 1 0 dB	Set the ATT value of the first way return module	Normal mode: the maximum adjustable range is MGC--30dB, AGC--10dB; RFOG mode: the default adjustable range is 20dB, the maximum adjustable range is 30dB.
Set Channel 1 Num 20	Set the channel number of the first way return module	The maximum channel number is 200; This menu is hidden under the RFOG mode.

6.3 The setting menu of the second way return module



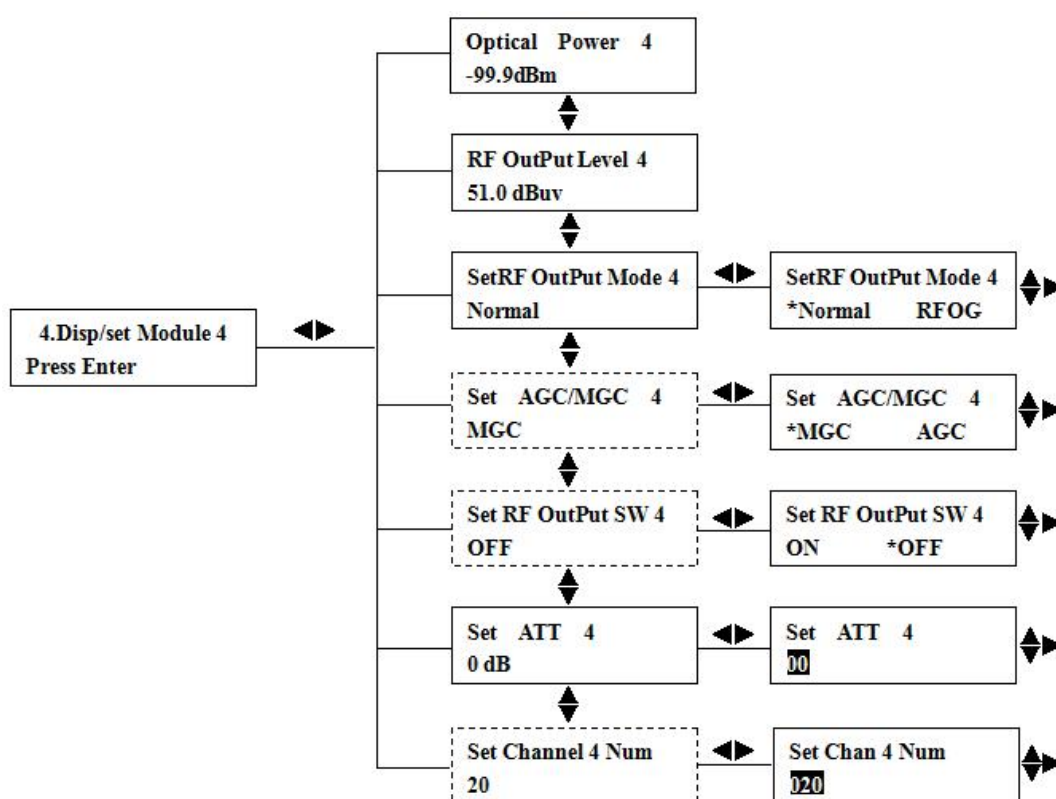
Displayed parameters	Comment	Remark
Optical Power 2 -99.9dBm	The input optical power of the second way return module	
RF OutPut Level 2 51.0 dBuv	The output level of the second way return module	
SetRF OutPut Mode 2 Normal	Set the RF output mode of the second way return module	Two modes optional: Normal: common mode; RFOG: burst mode.
Set AGC/MGC 2 MGC	Set the ATT mode of the second way return module	Two modes optional: AGC: turn on the optical AGC mode; MGC: turn off the optical AGC mode, manual adjustment. This menu is hidden under the RFOG mode.
Set RF OutPut SW 2 OFF	Set the RF output switch of the second way return module	ON: turn on; OFF: turn off This menu is hidden under the RFOG mode.
Set ATT 2 0 dB	Set the ATT value of the second way return module	Normal mode: the maximum adjustable range is MGC--30dB, AGC--10dB; RFOG mode: the default adjustable range is 20dB, the maximum adjustable range is 30dB.
Set Channel 2 Num 20	Set the channel number of the second way return module	The maximum channel number is 200; This menu is hidden under the RFOG mode.

6.4 The setting menu of the third way return module



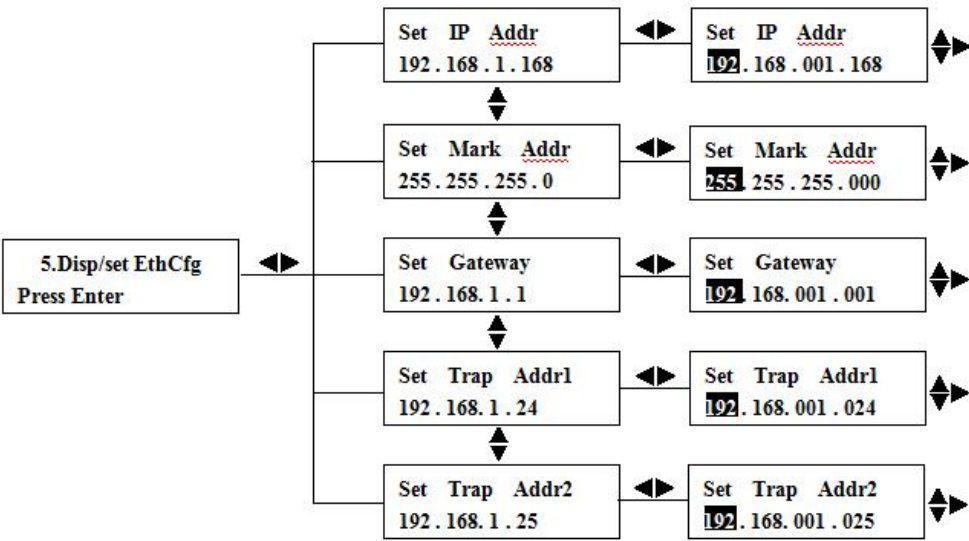
Displayed parameters	Comment	Remark
Optical Power 3 -99.9dBm	The input optical power of the third way return module	
RF OutPut Level 3 51.0 dBuv	The output level of the third way return module	
SetRF OutPut Mode 3 Normal	Set the RF output mode of the third way return module	Two modes optional: Normal: common mode; RFOG: burst mode.
Set AGC/MGC 3 MGC	Set the ATT mode of the third way return module	Two modes optional: AGC: turn on the optical AGC mode; MGC: turn off the optical AGC mode, manual adjustment. This menu is hidden under the RFOG mode.
Set RF OutPut SW 3 OFF	Set the RF output switch of the third way return module	ON: turn on; OFF: turn off This menu is hidden under the RFOG mode.
Set ATT 3 0 dB	Set the ATT value of the third way return module	Normal mode: the maximum adjustable range is MGC--30dB, AGC--10dB; RFOG mode: the default adjustable range is 20dB, the maximum adjustable range is 30dB.
Set Channel 3 Num 20	Set the channel number of the third way return module	The maximum channel number is 200; This menu is hidden under the RFOG mode.

6.5 The setting menu of the fourth way return module



Displayed parameters	Comment	Remark
Optical Power 4 -99.9dBm	The input optical power of the fourth way return module	
RF OutPut Level 4 51.0 dBuv	The output level of the fourth way return module	
SetRF OutPut Mode 4 Normal	Set the RF output mode of the fourth way return module	Two modes optional: Normal: common mode; RFOG: burst mode.
Set AGC/MGC 4 MGC	Set the ATT mode of the fourth way return module	Two modes optional: AGC: turn on the optical AGC mode; MGC: turn off the optical AGC mode, manual adjustment. This menu is hidden under the RFOG mode.
Set RF OutPut SW 4 OFF	Set the RF output switch of the fourth way return module	ON: turn on; OFF: turn off This menu is hidden under the RFOG mode.
Set ATT 4 0 dB	Set the ATT value of the fourth way return module	Normal mode: the maximum adjustable range is MGC--30dB, AGC--10dB; RFOG mode: the default adjustable range is 20dB, the maximum adjustable range is 30dB.
Set Channel 4 Num 20	Set the channel number of the fourth way return module	The maximum channel number is 200; This menu is hidden under the RFOG mode.

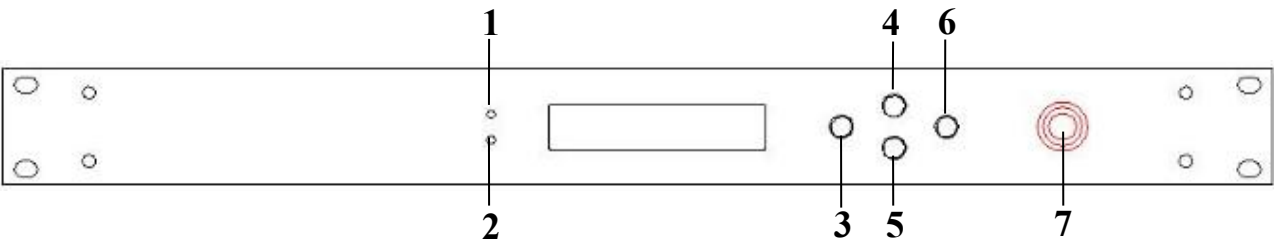
6.6 The setting menu of Ethernet parameters



Displayed parameters	Comment	Remark
Set IP Addr 192 . 168 . 1 . 168	Set IP address	Can change
Set Mark Addr 255 . 255 . 255 . 0	Set subnet mask	Can change
Set Gateway 192 . 168. 1 . 1	Set gateway	Can change
Set Trap Addr1 192 . 168. 1 . 24	Set trap1 address	Can change
Set Trap Addr2 192 . 168. 1 . 25	Set trap2 address	Can change

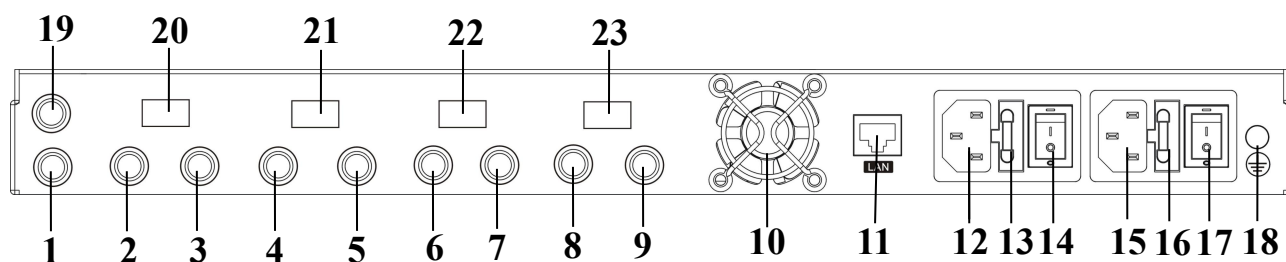
7. Product Schematic Diagram

7.1 Front Panel



1	Running indicator	2	Power indicator	3	Esc key
4	Up key	5	Down key	6	Enter key
7	Reserved preposition four-way mixed -20dB test port				

7.2 Rear Panel



1	Reserved four-way mixed RF output	2	-20dB test port 1	3	RF output 1
4	-20dB test port 2	5	RF output 2	6	-20dB test port 3
7	RF output 3	8	-20dB test port 4	9	RF output 4
10	Fan outlet	11	Network management interface	12	~AC220V power input
13	Fuse	14	Power switch	15	~AC220V power input
16	Fuse	17	Power switch	18	Grounding stud
19	Reserved postposition four-way mixed -20dB test port	20	Optical signal input 1	21	Optical signal input 2
22	Optical signal input 3	23	Optical signal input 4		

8. NMS setup instructions

If users configured the network management transponder, need to do the following settings:

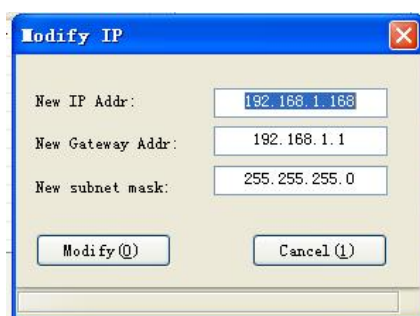
Transponder IP setup instruction:

Network management directly modify:

1. Default IP is 192.168.1.168 , default gateway is 192.168.1.1 , default subnet mask is 255.255.255.0
2. Connect the computer and transponder (can be direct connected), and change the computer IP to 192.168.1.XXX (XXX is any number from 0 to 255 except 168); start upper computer network management software, then search the device and log in.
3. Right-click device icon and choose modify the device IP.



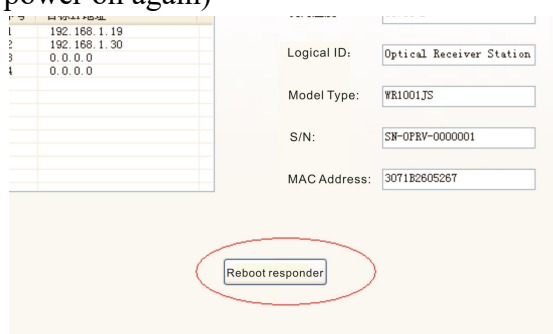
4. Enter new IP address, gateway and subnet mask.



5. Click modify , then exit, it is done. There will show new IP address and gateway on operational logbook.

Log Number	Log Type	Log Contents	Login time
1752	ChangIPAddress	Modify equipment192.168.1.168 IP address: New IP: 192.168.1.167;New gateway:192.168.1.1	2009-9-9 12:39:03

6. Reboot the transponder, the new IP take effect (Click the reboot button in the network management software or power on again)



9. Clean and maintenance method of the optical fiber active connector

In many times, we consider the decline of the optical power as the equipment faults, but actually it may be caused by that the optical fiber connector was polluted by dust or dirt. Inspect the fiber connector, component, or bulkhead with a fiberscope. If the connector is dirty, clean it with a cleaning technique following these steps:

1. Turn off the device power supply and carefully pull off the optical fiber connector from the adapter.
2. Wash carefully with good quality lens wiping paper and medical absorbent alcohol cotton. If use the medical absorbent alcohol cotton, still need to wait 1~2 minutes after wash, let the connector surface dry in the air.
3. Cleaned optical connector should be connected to optical power meter to measure output optical power to affirm whether it has been cleaned up.
4. When connect the cleaned optical connector back to adapter, should notice to make force appropriate to avoid china tube in the adapter crack.
5. The optical fiber connector should be cleaned in pairs. If optical power is on the low side after clean, the adapter may be polluted, clean it. (Note: Adapter should be carefully operated, so as to avoid hurting inside fiber.
6. Use compressed air or degrease alcohol cotton to wash the adapter carefully. When use compressed air, the muzzle aims at china tube of the adapter, clean the china tube with compressed air. When use degrease alcohol cotton, insert directions need be consistent, otherwise can't reach a good clean effect.